

owner must then correct the deficiencies, if any, and operate the facility for an in-service evaluation by the Federal Aviation Administration.

§ 171.105 Minimum requirements for approval.

(a) The following are the minimum requirements that must be met before the Federal Aviation Administration will approve an IFR procedure for a non-Federal Simplified Directional Facility:

(1) A suitable frequency channel must be available.

(2) The facility's performance, as determined by air and ground inspection, must meet the requirements of §§ 171.109 and 171.111.

(3) The installation of the equipment must meet the requirements of § 171.113.

(4) The owner must agree to operate and maintain the facility in accordance with § 171.115.

(5) The owner must agree to furnish periodic reports as set forth in § 171.117, and agree to allow the FAA to inspect the facility and its operation whenever necessary.

(6) The owner must assure the FAA that he will not withdraw the facility from service without the permission of the FAA.

(7) The owner must bear all costs of meeting the requirements of this section and of any flight or ground inspections made before the facility is commissioned, except that the FAA may bear certain of these costs subject to budgetary limitations and policy established by the Administrator.

(b) If the applicant for approval meets the requirements of paragraph (a) of this section, the FAA commissions the facility as a prerequisite to its approval for use in an IFR procedure. The approval is withdrawn at any time the facility does not continue to meet those requirements. In addition, the facility is licensed by the Federal Communications Commission. The Federal Aviation Administration recommends cancellation or nonrenewal of the Federal Communications Commission license whenever the frequency channel is needed for higher priority common system service.

§ 171.107 Definition.

As used in this subpart:

SDF (simplified directional facility) means a directional aid facility providing only lateral guidance (front or back course) for approach from a final approach fix.

DDM (difference in depth of modulation) means the percentage modulation depth of the larger signal minus the percentage modulation depth of the smaller signal, divided by 100.

Angular displacement sensitivity means the ratio of measured DDM to the corresponding angular displacement from the appropriate reference line.

Back course sector means the course sector on the opposite end of the runway from the front course sector.

Course line means the locus of points along the final approach course at which the DDM is zero.

Course sector means a sector in a horizontal plane containing the course line and limited by the loci of points nearest to the course line at which the DDM is 0.155.

Displacement sensitivity means the ratio of measured DDM to the corresponding lateral displacement from the appropriate reference line.

Front course sector means the course sector centered on the course line in the direction from the runway in which a normal final approach is made.

Half course sector means the sector in a horizontal plane containing the course line and limited by the loci of points nearest to the course line, at which the DDM is 0.0775.

Point A means a point on the front course in the approach direction a distance of 4 nautical miles from the threshold.

Point A1 means a point on the front course in the approach direction a distance of 1 statute mile from the threshold.

Point A2 means a point on the front course at the threshold.

Reference datum means a point at a specified height located vertically above the intersection of the course and the threshold.

Missed approach point means the point on the final approach course, not farther from the final approach fix

than Point “A2”, at which the approach must be abandoned, if the approach and subsequent landing cannot be safely completed by visual reference, whether or not the aircraft has descended to the minimum descent altitude.

§ 171.109 Performance requirements.

(a) The Simplified Directional Facility must perform in accordance with the following standards and practices:

(1) The radiation from the SDF antenna system must produce a composite field pattern which is amplitude modulated by a 90 Hz and a 150 Hz tone. The radiation field pattern must produce a course sector with the 90 Hz tone predominating on one side of the course and with the 150 Hz tone predominating on the opposite side.

(2) When an observer faces the SDF from the approach end of runway, the depth of modulation of the radio-frequency carrier due to the 150 Hz tone must predominate on his right hand and that due to the 90 Hz tone must predominate on his left hand.

(3) All horizontal angles employed in specifying the SDF field patterns must originate from the center of the antenna system which provides the signals used in the front course sector.

(4) The SDF must operate on odd tenths or odd tenths plus a twentieth MHz within the frequency band 108.1 MHz to 111.95 MHz. The frequency tolerance of the radio frequency carrier must not exceed plus or minus 0.002 percent.

(5) The radiated emission from the SDF must be horizontally polarized. The vertically polarized component of the radiation on the course line must not exceed that which corresponds to an error one-twentieth of the course sector width when an aircraft is positioned on the course line and is in a roll attitude of 20° from the horizontal.

(6) The SDF must provide signals sufficient to allow satisfactory operation of a typical aircraft installation within the sector which extends from the center of the SDF antenna system to distances of 18 nautical miles within a plus or minus 10° sector and 10 nautical miles within the remainder of the coverage when alternative navigational facilities provide satisfactory coverage

within the intermediate approach area. SDF signals must be receivable at the distances specified at and above a height of 1,000 feet above the elevation of the threshold, or the lowest altitude authorized for transition, whichever is higher. Such signals must be receivable, to the distances specified, up to a surface extending outward from the SDF antenna and inclined at 7° above the horizontal.

(7) The modulation tones must be phase-locked so that within the half course sector, the demodulated 90 Hz and 150 Hz wave forms pass through zero in the same direction within 20° of phase relative to the 150 Hz component, every half cycle of the combined 90 Hz and 150 Hz wave form. However, the phase need not be measured within the half course sector.

(8) The angle of convergence of the final approach course and the extended runway centerline must not exceed 30°. The final approach course must be aligned to intersect the extended runway centerline between points A1 and the runway threshold. When an operational advantage can be achieved, a final approach course that does not intersect the runway or that intersects it at a distance greater than point A1 from the threshold, may be established, if that course lies within 500 feet laterally of the extended runway centerline at a point 3,000 feet outward from the runway threshold. The mean course line must be maintained within ±10 percent of the course sector width.

(9) The nominal displacement sensitivity within the half course sector must be 50 microamperes/degree. The nominal course sector width must be 6°. When an operational advantage can be achieved, a nominal displacement sensitivity of 25 microamperes/degree may be established, with a nominal course sector width of 12° with proportional displacement sensitivity. The lateral displacement sensitivity must be adjusted and maintained within the limits of plus or minus 17 percent of the nominal value.

(10) The off-course (clearance) signal must increase at a substantially linear rate with respect to the angular displacement from the course line up to an angle on either side of the course